



Early Journal Content on JSTOR, Free to Anyone in the World

This article is one of nearly 500,000 scholarly works digitized and made freely available to everyone in the world by JSTOR.

Known as the Early Journal Content, this set of works include research articles, news, letters, and other writings published in more than 200 of the oldest leading academic journals. The works date from the mid-seventeenth to the early twentieth centuries.

We encourage people to read and share the Early Journal Content openly and to tell others that this resource exists. People may post this content online or redistribute in any way for non-commercial purposes.

Read more about Early Journal Content at <http://about.jstor.org/participate-jstor/individuals/early-journal-content>.

JSTOR is a digital library of academic journals, books, and primary source objects. JSTOR helps people discover, use, and build upon a wide range of content through a powerful research and teaching platform, and preserves this content for future generations. JSTOR is part of ITHAKA, a not-for-profit organization that also includes Ithaka S+R and Portico. For more information about JSTOR, please contact support@jstor.org.

drawings are of bud, leaf-scar, pith, and other twig characters upon which the keys are based, so that with the use of a hand lens it should be possible to determine readily the genera, and for the most part the species, for native and introduced trees and shrubs. The author is to be congratulated in making such a fund of unusual information available in such a compact and readily available form.—GEO. D. FULLER.

American trees.—Another book on trees, by EMERSON and WEED,⁵ has been added to the already large number upon the same subject. It is essentially a book for the amateur, since its chief virtue lies in the excellent photographs by EMERSON, an entire page being devoted to each species. The absence of keys of any sort renders the book comparatively useless for the identification of an unknown species, but the quality and abundance of the illustrations will make it one the tree lover will wish to have upon his table.—GEO. D. FULLER.

NOTES FOR STUDENTS

Physiological balance in soil and other nutrient solutions.—HIBBARD⁶ has just published a piece of work on physiological balance in soil solution which is to mark a decided advance (both theoretically and practically), if the future development of the work approximates its present promise. He extracted the soil solution from an infertile very sandy soil and from a fertile sandy loam by the Van Suchtelen oil pressure method as improved and extended in usefulness by MORGAN.⁷ HIBBARD speaks of this as giving a more concentrated solution than any other extraction method. The solution thus extracted from the poor sandy soil had an osmotic pressure of 0.193 atmospheres, and that from the good soil 1.81 atmospheres. The soil extracts showed an order of production similar to the soils from which they came.

The soil extracts were used instead of distilled water to prepare the Shive 3-salt (KH_2PO_4 , $\text{Ca}(\text{NO}_3)_2$, MgSO_4) nutrient solution. The total concentration of nutrient salts added gave an osmotic pressure of 1.75 atmospheres, and in the 36 different solutions made up from each soil extract and from distilled water the proportions of each salt varied from 10 to 80 per cent of the total nutrient salt osmotic concentration.

In the nutrient solution made from the extract of the poor soil the optimum osmotic proportions of the KH_2PO_4 , $\text{Ca}(\text{NO}_3)_2$, and MgSO_4 for the growth of Fultz wheat were 7:1:2 respectively, with a total osmotic pressure of $(1.75 + 0.193) 1.94$ atmospheres; in that made from the extract of the good soil 2:7:1 respectively, with a total osmotic pressure of $(1.75 + 1.81) 3.56$ atmospheres; and in that made with distilled water 5:2:3, with a total osmotic pressure of

⁵ EMERSON, ARTHUR I., and WEED, C. M., *Our trees, how to know them.* New ed. pp. xxi+295. *pls. 149.* Philadelphia: Lippincott Co. \$3.50.

⁶ HIBBARD, R. P., *Physiological balance in the soil solution.* Tech. Bull. Mich. Agric. Exper. Sta. no. 40. pp. 44. 1917.

⁷ Tech. Bull. Mich. Agric. Coll. Exper. Sta. no. 28.